

Application No. 10/026,919  
Reply to Office Action mailed September 9, 2005

### AMENDMENTS TO THE CLAIMS

Please amend the claims as reflected in the following listing of claims. *The listing of claims will replace all prior versions and listings of claims in the application:*

1. (Cancelled)
2. (Currently Amended) The VCSEL of claim ~~4~~34 wherein said barrier layers are comprised of GaAsN.
3. (Currently Amended) The VCSEL of claim ~~4~~34 wherein said confinement layers are comprised of AlGaAs.
4. (Cancelled)
5. (Currently Amended) The VCSEL of claim ~~4~~34 wherein said at least one quantum well further comprises  $>1\%$  N.
6. (Currently Amended) The VCSEL of claim ~~4~~34 wherein said at least one quantum well is up to and including  $50\text{\AA}$  in thickness.
7. (Previously Presented) The VCSEL of claim 5 wherein said at least one quantum well is up to and including  $50\text{\AA}$  in thickness.

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8. (Cancelled)

9. (Original) The VCSEL of claim 5 wherein said confinement layers are comprised of AlGaAs.

10. - 13. (Cancelled)

14. (Currently Amended) The VCSEL of claim ~~13~~ wherein said at least one quantum well is further comprised of Sb.

15. (Previously Presented) The VCSEL of claim 14 wherein said barrier layers are comprised of GaAsN.

16. (Original) The VCSEL of claim 14 wherein said confinement layers are comprised of AlGaAs.

17. (Cancelled)

18. (Original) The VCSEL of claim 15 wherein said confinement layers are comprised of AlGaAs.

19. - 20. (Cancelled)

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21. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL) comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including AlGaAs barrier layers sandwiching said at least one quantum well; and

confinement layers sandwiching said active region.

22. **(Original)** The VCSEL of claim 19 wherein said confinement layers are comprised of AlGaAs.

23. **(Previously Presented)** The VCSEL of claim 21 wherein said at least one quantum well is up to and including 50Å in thickness.

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24. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL) comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including barrier layers sandwiching said at least one quantum well; and AlGaAs confinement layers sandwiching said active regions.

25. **(Original)** The VCSEL of claim 24 wherein said barrier layers are comprised of AlGaAs.

26. **(Original)** The VCSEL of claim 24 wherein said barrier layers are comprised of InGaAsN.

27. **(Previously Presented)** The VCSEL of claim 24 wherein said at least one quantum well is up to and including 50Å in thickness.

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28. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including AlGaAs barrier layers sandwiching said at least one quantum well; and

AlGaAs confinement layers sandwiching said active region.

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29. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including InGaAs barrier layers sandwiching said at least one quantum well; and

AlGaAs confinement layers sandwiching said active region.

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30. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including GaAsN barrier layers sandwiching said at least one quantum well; and

GaAsN confinement layers sandwiching said active region.

31. **(Cancelled).**

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32. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well having a well depth of at least 40 meV and comprised of InGaAsN and including GaAsN barrier layers sandwiching said at least one quantum well; and

AlGaAs confinement layers sandwiching said active region.



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33. (Previously Presented) A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well comprised of InGaAsN and including AlGaAs barrier layers sandwiching said at least one quantum well; and

GaAsN confinement layers sandwiching said active region.

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34. **(Previously Presented)** A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well and including barrier layers sandwiching said at least one quantum well, at least one of the quantum well and the barrier layers including nitrogen;

upper and lower confinement layers sandwiching said active region, wherein the barrier layers and/or the upper and lower confinement layers are comprised of material that reduces a level of non-confining valence band discontinuity in the quantum well due to the presence of nitrogen in the quantum well; and

a flattening layer interposed between the lower confinement layer and the at least one quantum well.